Maintenance Decision Support System

New Tools for Weather Response

Adverse weather conditions dramatically affect the nation's surface transportation system. During bad weather 6,600 people die, 470,000 people are injured, and 544 million hours of time are lost annually. The Federal Highway Administration (FHWA) has taken the lead in responding by building upon the proactive maintenance approaches already used in the winter maintenance community today. The result is a next generation of road weather information systems called the Maintenance Decision Support System (MDSS) for winter road maintenance decision-makers. It is currently a prototype and is now available on FHWA's Road Weather Management web page (http://www.ops.fhwa.dot.gov/weather).

Developing the Next Generation of Road Weather Information Systems

The MDSS is part of a progressive FHWA program designed to respond to changing weather conditions and their impacts on the highway system. This work is taking place under the direction and funding of the National Intelligent Transportation Systems (ITS) Program. With the right information, winter maintenance managers can respond proactively by managing the infrastructure and deploying resources in real time. Yes – Something can be done about the weather!

The MDSS was designed with the needs of state Departments of Transportation (DOTs) in mind and allows state winter maintenance managers to:

- View predicted weather conditions throughout the state;
- Become aware of the potential for deteriorating road conditions before they occur;
- Predict impacts of weather on road conditions;
- Plan treatment scenarios based on available resources, including the use of chemicals and plowing of roads; and
- Receive treatment recommendations based on proven rules of practice.

The primary goal of the MDSS is to get proper weather, road condition, and resource information into the appropriate people's hands so they can make proactive decisions to manage the transportation system before and during adverse weather conditions. The benefits include reduced operating expenses and a higher level of service, which result in safer and smoother highway operations and traffic flow. The MDSS will also make more efficient use of chemicals which reduces impacts on the environment.

Making the MDSS Available

Each state has unique road weather management needs. Managing a regional freeway system during a snowstorm in Minnesota versus the same storm in Tennessee would require

vastly different strategies due to the experiences of the road users, the availability of equipment, and state policies. The beauty of the MDSS is its modularity. States can pick and choose from the different strengths of the modules to make a tailored system that best fits their needs. The result is better decision-making by transportation managers that helps make the roads safer for all users.

The MDSS has been developed by several U.S. Government Laboratories for FHWA, and is being made available to state DOTs and the private sector to customize and meet the demands of local conditions.

Encouraging Private Sector Development

FHWA has funded the development of the MDSS prototype so DOTs can begin to specify the particular MDSS components necessary to meet their specific winter maintenance management needs. The implementation of the MDSS for state and region-specific applications will likely rely on the private sector. While state DOTs are seen as the primary end users of the MDSS, FHWA anticipates that the product itself will be developed in the private sector, based initially on MDSS technologies. It is therefore important that the private sector be aware of how road weather management and MDSS applications tie together. FHWA is committed to facilitating this awareness and encouraging a robust and competitive market for road-weather services.

Keeping the Public Involved

While DOTs will be responsible for implementing the MDSS, the primary beneficiaries of any proactive road weather management system are the highway users themselves – the general public. The public has a stake in the success of MDSS, and will benefit from fewer crashes and improved mobility during adverse weather.

Providing MDSS Support and Information

The MDSS prototype and other useful materials are available on the FHWA Road Weather Management web page (http://www.ops.fhwa.dot.gov/weather). The prototype was released during the fall of 2002 and, through FHWA's commitment to road weather management, will be evaluated through field demonstrations and operational tests. FHWA will also continue to provide, based on funding availability, limited user support and ongoing MDSS research and development.

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